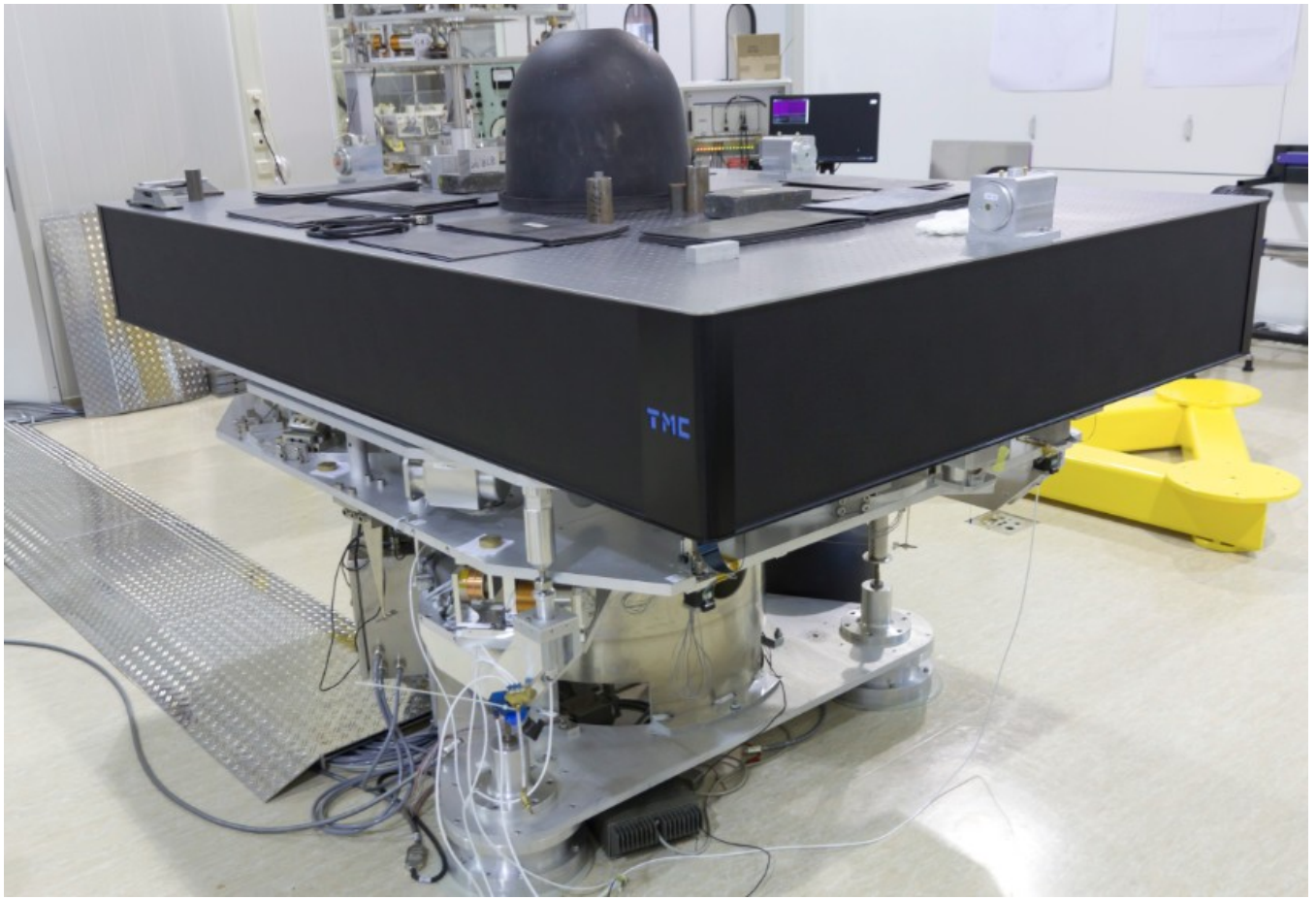
EIB-SAS status

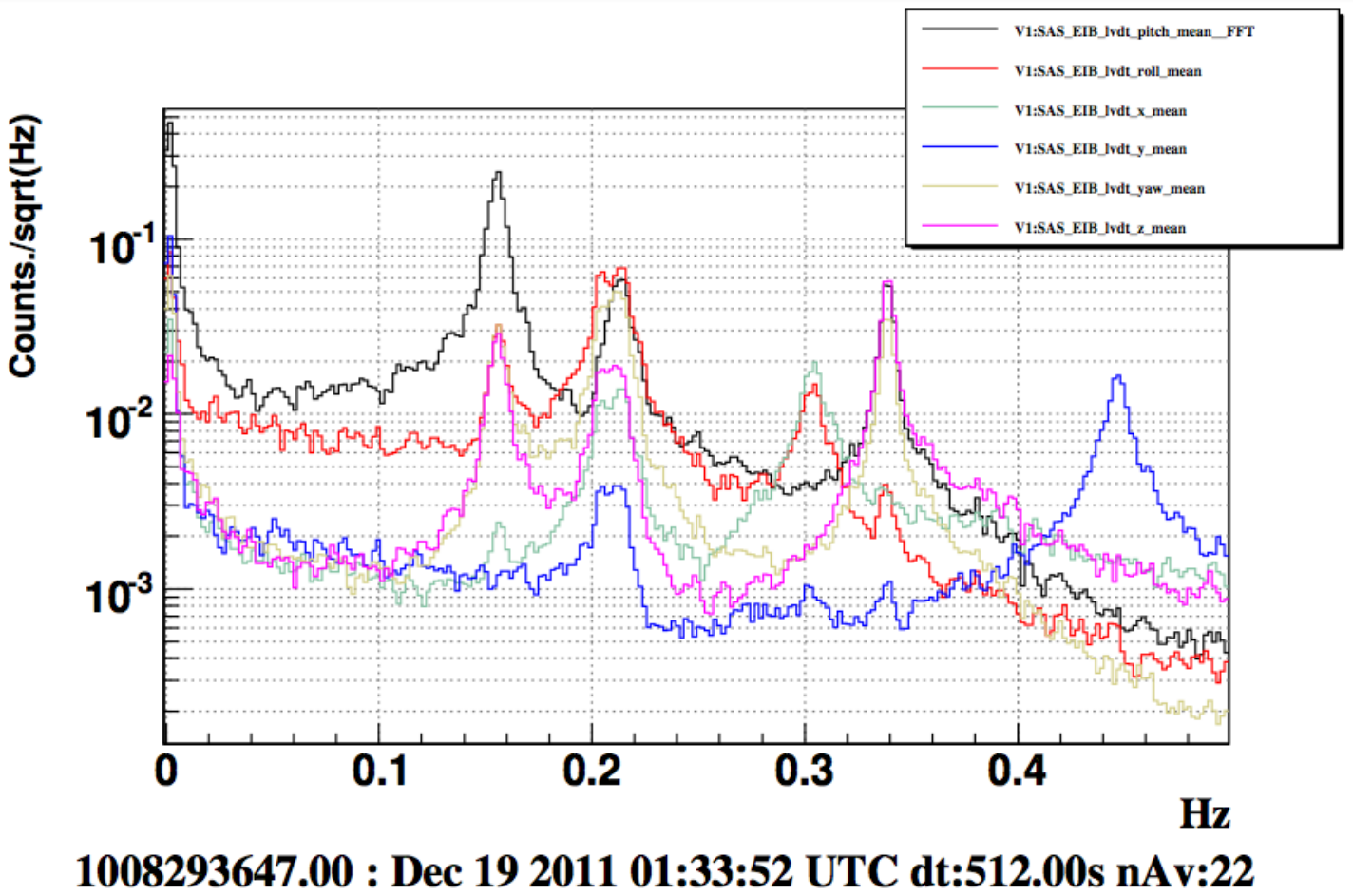


A. Bertolini on behalf of the SBE subsystem

Improving workability on the bench

Stiffening pitch and roll degrees of freedom

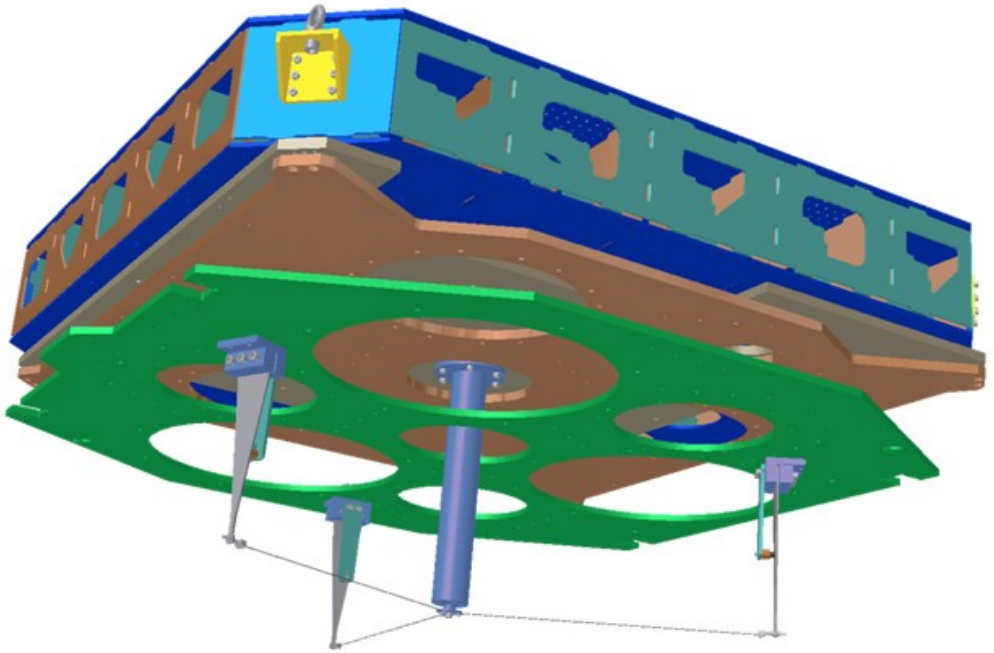
During pre-commissioning a mode (mainly Tx) with low natural frequency (160 mHz) was causing large hysteresis and reducing repeatability of the free floating position after locking/unlocking procedure.



Improving workability on the bench

Stiffening pitch and roll degrees of freedom

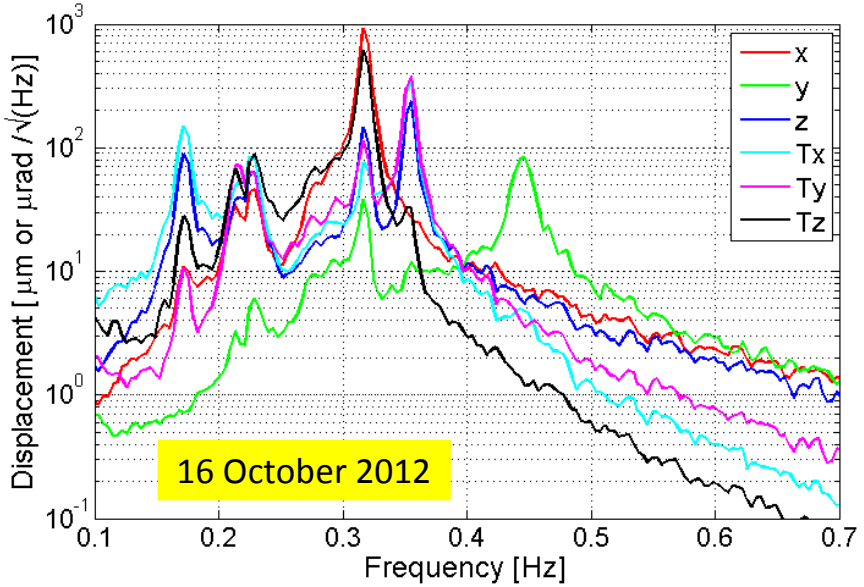
The three vertical blades allow to stiffen pitch and roll without changing the vertical mode

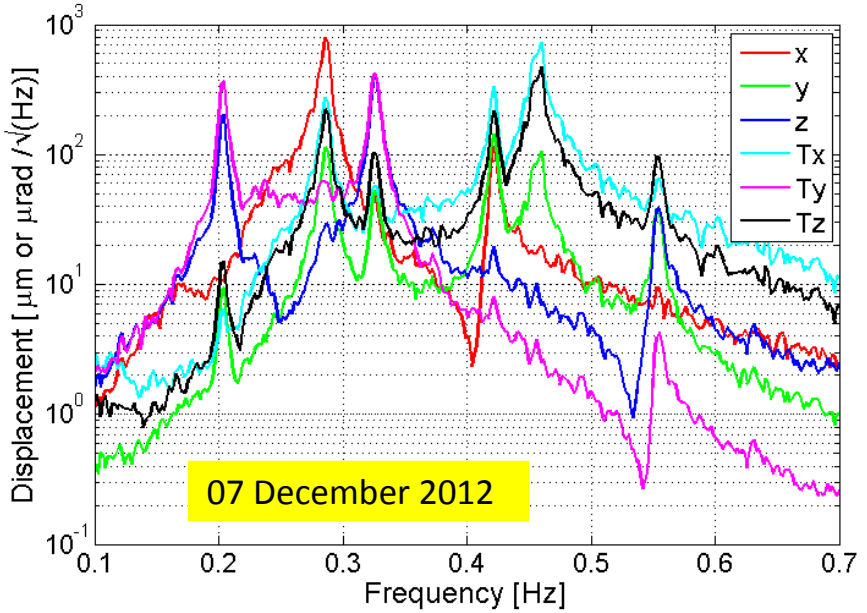


An additional $\frac{3}{2}K_s h^2$ elastic angular stiffness is introduced.

Improving workability on the bench

Stiffening pitch and roll degrees of freedom





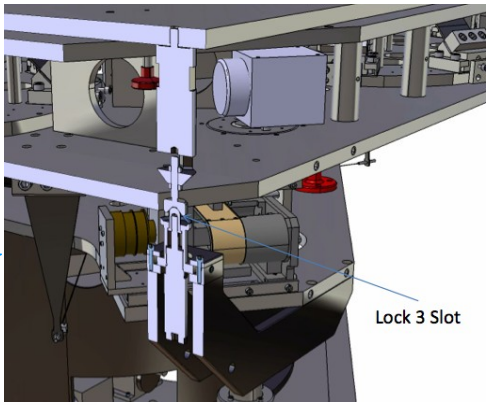
Mode	Frequency (mHz)	Components
1	172	Tx, z
2	213	Ty, Tz, Tx, z, x
3	229	Tz, Tx, Ty, x, z
4	317	x, Tz
5	355	Tx, Ty, z
6	446	y

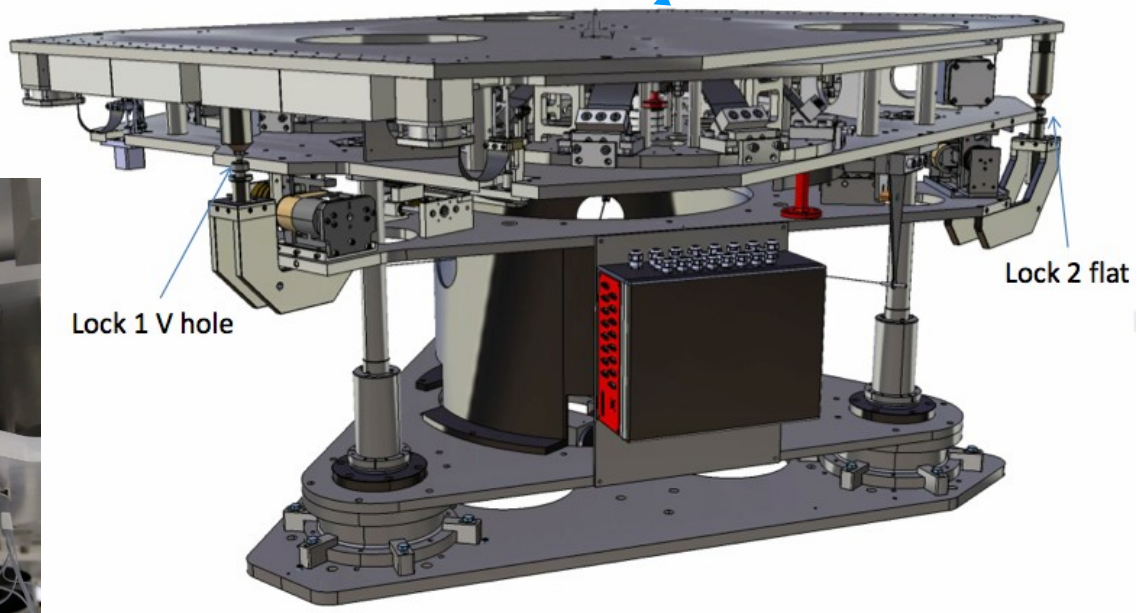
Mode	Frequency (mHz)	Components
1	204	Ty, z
2	287	x, Tx, Tz
3	326	z, Ty, Tz
4	420	Tx, Tz, y, x
5	460	Tx, Tz, y
6	553	Tz, Tx, z, y

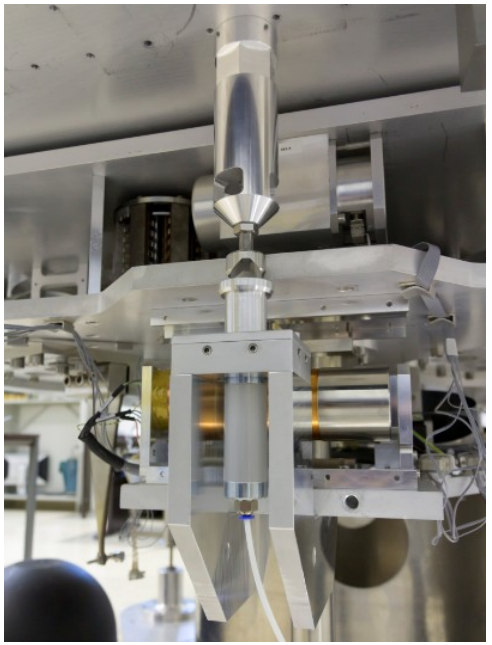
Improving workability on the bench

New locking mechanism based on a kinematic mount

The locking pins are actuated by means of compressed air







To see it in action click on the following link:

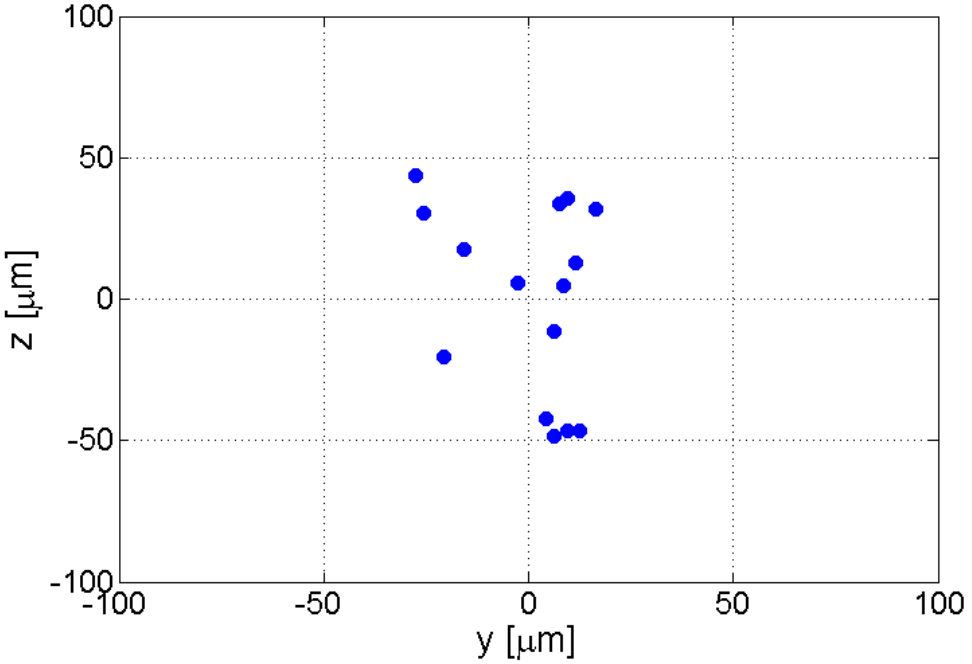
http://www.nikhef.nl/pub/departments/mt/projects/virgo/seismicattenuation/production/Externalbench/slides/EIB_SAS_locksystem.html

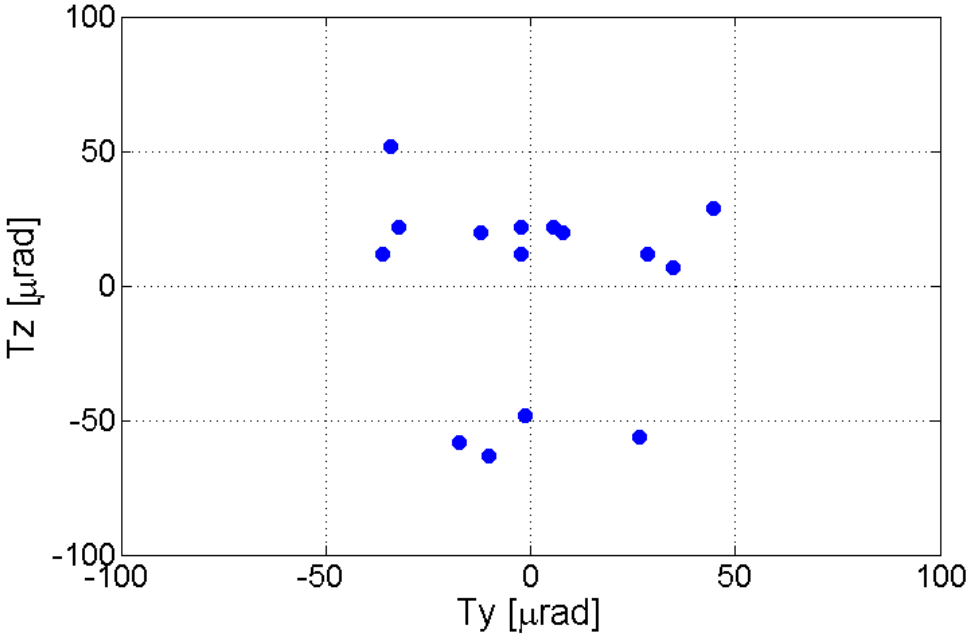
Improving workability on the bench

New locking mechanism: first test results

- Free floating position recovered within 10 µm or 10 µrad in all 6 dof !!!

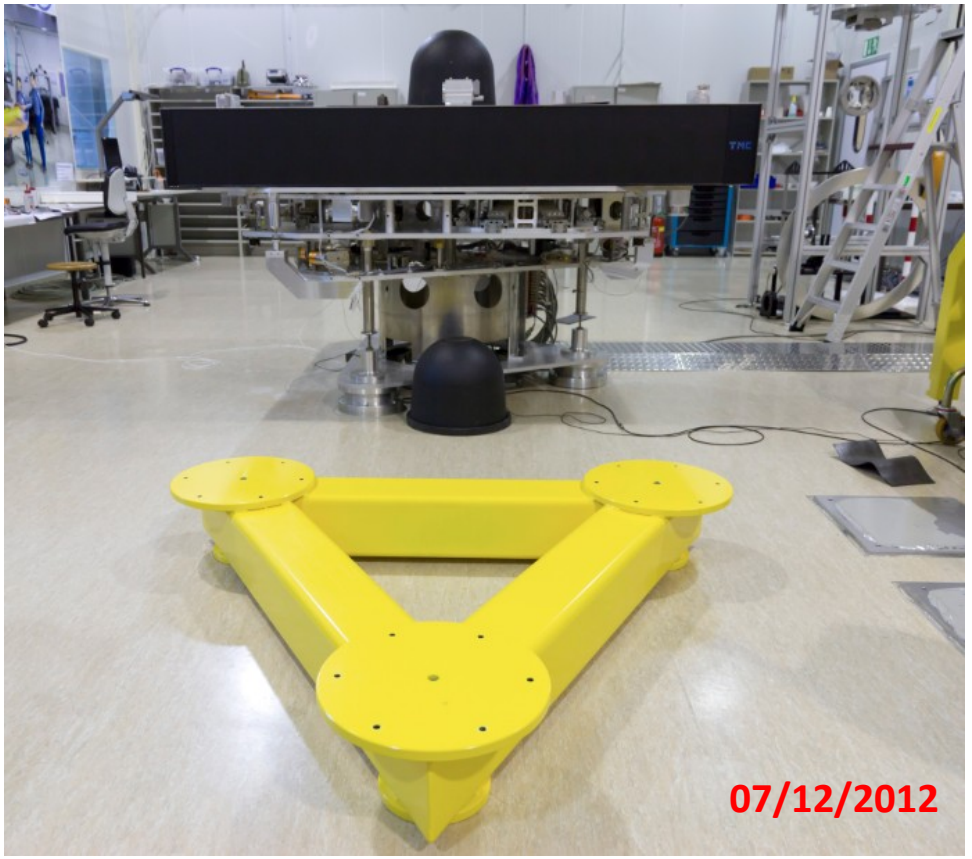
- Locked position repeatability:

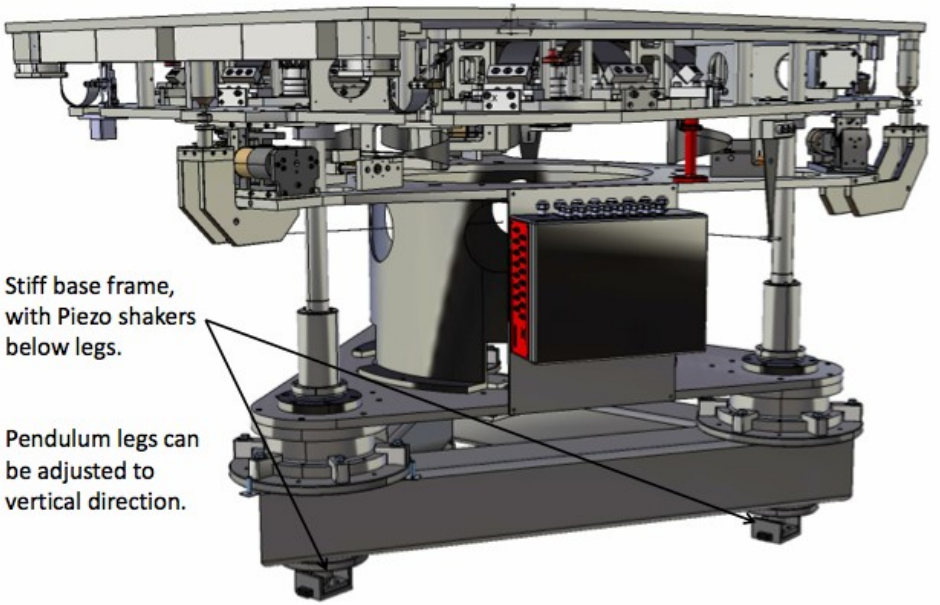




DOF	X	Y	Z	Tx	Ty	Tz
σ(µm or µrad)	52	15	28	24	21	28

EIB-SAS – Upcoming activities and planning

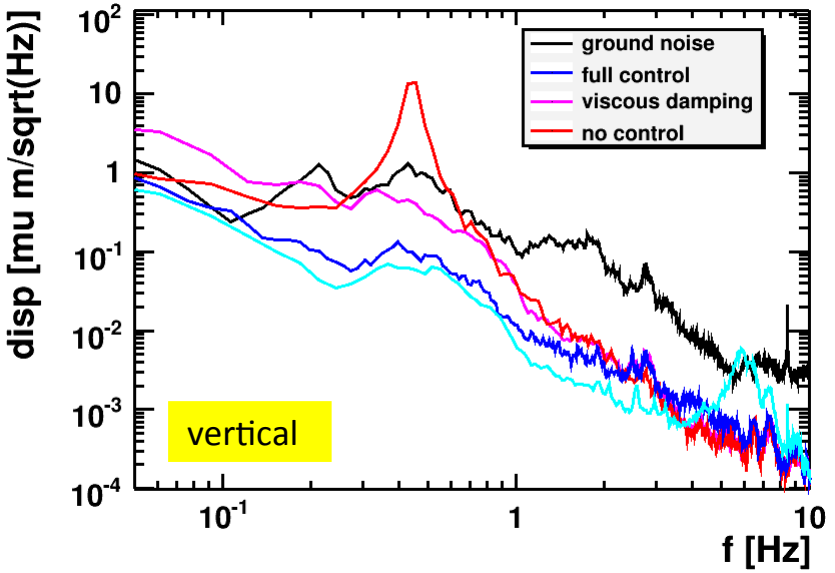


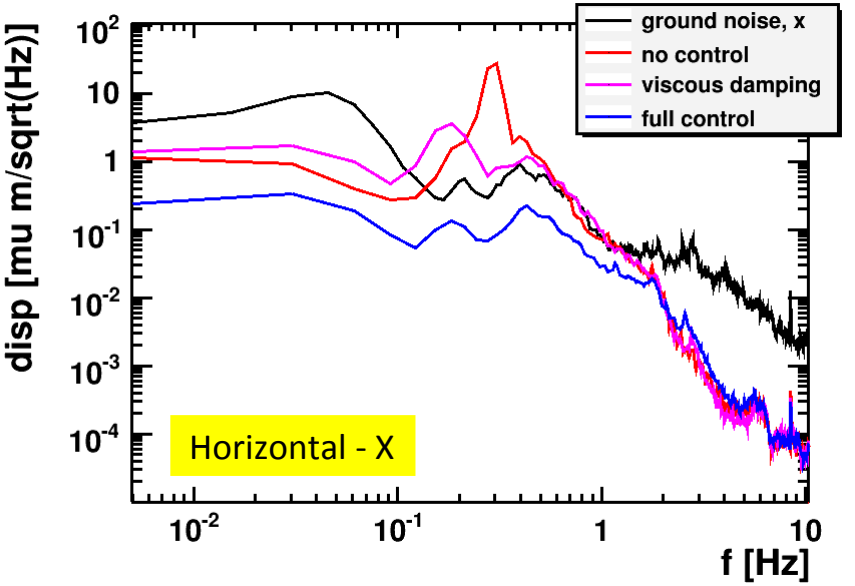


- Install PZT based shaking system
- Continue on controls development
- EIB-SAS final AdV installation is foreseen on September 2013

EIB-SAS – Tuning up towards the final installation

Active seismic isolation at the microseismic peak by sensor correction proven successfully





Good reduction in the overall RMS achieved: about 10 fold in translation, 5 fold in rotation